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10/718,412	11/19/2003	Julius Robson	920476-95123	9671
23644 7590 07/29/2008 BARNES & THORNBURG LLP P.O. BOX 2786 CHICAGO, IL 60690-2786				
EXAMINER				
CHO, UN C				
ART UNIT		PAPER NUMBER		
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patent-ch@btlaw.com

Office Action Summary

Application No.

10/718,412

Applicant(s)

ROBSON ET AL.

Examiner

Un C. Cho

Art Unit

2617

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 April 2008.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-5 and 7-40 is/are rejected.
7) ☒ Claim(s) 6 is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/CD/CD)
Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 12 – 15, 24, 37 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art (hereinafter APA) in view of Sato et al. (US 2003/0069042 A1).

Regarding claim 1, the APA discloses establishing a number of resource units making up a fixed allocation of resource units which is the same for all user equipments of the network (APA: Page 1, line 30 through Page 2, line 6); allocating the fixed allocation of resource units to each child user equipment in the partition (APA: Page 2, lines 7 – 10).

However, the APA as applied above does not specifically disclose that said fixed allocation of resource units being the same for all user equipments of the network. In an analogous art, Sato remedies the deficiencies of the APA by disclosing such limitation wherein the number of allocated channels being the same for all user equipments of the network (see Table 6 on Page 7 and Paragraph 0111 wherein each sector (i.e. A, B and C) has the same number of allocated channels; Page 8, Paragraph 0123, line 1 through Page 9, Paragraph 0139, line 6). Therefore, it would have been obvious to one of ordinary skill in the

art at the time the invention was made to provide the technique of Sato to the system of the admitted prior art in order to provide an effective method to set an appropriate number resource sin each service area such as sector.

Regarding claims 12, 13, 14, 15, 24, 37 and 38, the claims are interpreted and rejected for the same reason as set forth in claim 1.

3. Claims 2 – 4, 7, 16 – 18, 20, 25, 26, 29, 33 – 35 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over the APA in view of Sato as applied to claim 1 above and further in view of Wu et al. (US 2004/0125772 A9).

Regarding claim 2, the APA in view of Sato as applied above does not specifically disclose determining a measure of a maximum likely number of child user equipments per partition of the network; calculating the fixed allocation of resource units based on the ratio of a number of resource units in the partition per unit time to the measure. In an analogous art, Wu remedies the deficiencies of the APA by disclosing such limitation on Page 5, Paragraph 0090, line 1 through Paragraph 0102, line 6 wherein a number of active users is determined within a partition and performs optimization based on the maximization of proportional factors such as transmission rate and average throughput. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the technique of Wu to the modified system of the APA in view of Sato in order to provide an optimization technique to limit the interference and increase Signal-to-Noise Ratio.

Regarding claim 3, Wu as applied above discloses wherein the fixed allocation is a selected minimum number of resource units (each sector operating in two sub-bands; Wu: Page 4, Paragraph 0080, line 1 through Paragraph 0081, line 10).

Regarding claim 4, Wu as applied above discloses wherein the spectral resource is made up of a number of frequency channels and each resource unit is a subset of the spectral resource smaller than a frequency channel (an available bandwidth is divided into three sub-bands wherein each sector is only allowed to use two of the sub-bands; Wu: Page 4, Paragraph 0080, line 1 through Paragraph 0081, line 10).

Regarding claim 7, Wu as applied above discloses wherein resource units which are not allocated in the fixed allocation of resource units to child user equipments remain unallocated to user equipments (Wu discloses that in performing optimization it takes into account two active users, however, there are more than two users per partition which might not be active, thus it would have been obvious to one of ordinary skill in the art to know that inactive users will not be allocated with any resources; Wu: Page 5, line 1 through Paragraph 0094, line 7).

Regarding claims 16, 25, 33, 34 and 35, the claims are interpreted and rejected for the same reason as set forth in claim 2.

Regarding claims 17 and 28, the claims are interpreted and rejected for the same reason as set forth in claim 3.

Regarding claims 18 and 26, the claims are interpreted and rejected for the same reason as set forth in claim 4.

Regarding claims 20 and 29, the claims are interpreted and rejected for the same reason as set forth in claim 7.

Regarding claim 39, the APA discloses allocating the fixed allocation of resource units to each child user equipment in the partition (APA: Page 2, lines 7 – 10). However, the APA as applied above does not specifically disclose that said fixed allocation of resource units being the same for all user equipments of the network. In an analogous art, Sato remedies the deficiencies of the APA by disclosing such limitation wherein the number of allocated channels being the same for all user equipments of the network (see Table 6 on Page 7 and Paragraph 0111 wherein each sector (i.e. A, B and C) has the same number of allocated channels; Page 8, Paragraph 0123, line 1 through Page 9, Paragraph 0139, line 6). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the technique of Sato to the system of the admitted prior art in order to provide an effective method to set an appropriate number resource sin each service area such as sector.

However, the APA in view of Sato as applied above does not specifically disclose determining a measure of a maximum likely number of chilled user equipments partition of the network; calculating a fixed allocation of resource units based on the ratio of a number of resource units in the partition per unit time to the measure. In an analogous art, Wu remedies the deficiencies of the

APA in view of Sato by disclosing such limitation on Page 5, Paragraph 0090, line 1 through Paragraph 0102, line 6 wherein a number of active users is determined within a partition and performs optimization based on the maximization of proportional factors such as transmission rate and average throughput. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the technique of Wu to the modified system of the APA in view of Sato in order to provide an optimization technique to limit the interference and increase Signal-to-Noise Ratio.

4. Claims 5, 19 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over APA in view of Sato and in view of Wu as applied to claim 2 above, and further in view of Hwang et al. (US 2004/0097238 A1).

Regarding claim 5, the APA in view of Sato and in view of Wu as applied above does not specifically disclose wherein the measure of the maximum likely number of user equipments per partition is derived according to a Poisson distribution of the average number of user equipments per partition of the network. In an analogous art, Hwang remedies the deficiencies of the APA in view of Wu by disclosing such limitation on Page 3, Paragraph 0054, lines 1 – 3 wherein numbers of users are derived according to a Poisson distribution. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the technique of Hwang to the modified system of the APA in view of Sato and in view of Wu in order to provide an

effective method of increasing frequency reuse in an OFDM mobile communication system according to a determined number of users.

Regarding claims 19 and 27, the claims are interpreted and rejected for the same reason as set forth in claim 5.

5. Claims 8, 9, 21, 22, 30, 31 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over the APA in view of Sato as applied to claim 1 above and further in view of Hwang et al.

Regarding claim 8, the APA in view of Sato as applied above does not specifically disclose determining the gain of the radio link between the partition and each child user equipment; and allocating the remaining resource units among the child user equipments by prioritizing user equipments having a high gain link. In an analogous art, Hwang disclosing such limitation on Page 4, Paragraph 0068, line 1 through Paragraph 0096, line 6 wherein resources are allocated to the MS having the lowest SIR. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the technique of Hwang to the modified system of the APA in view of Sato in order to provide an effective method of increasing frequency reuse in an OFDM mobile communication system according to a determined number of users.

Regarding claim 9, Hwang as applied above discloses determining the gain of the radio link between the partition and each child user equipment; and

allocating the remaining resource units among the child user equipments in the partition in proportion to the gain of the radio links to the child user equipments (Hwang: Page 4, Paragraph 0068, line 1 through Paragraph 0096, line 6).

Regarding claims 21 and 30, the claims are interpreted and rejected for the same reason as set forth in claim 8.

Regarding claims 22 and 31, the claims are interpreted and rejected for the same reason as set forth in claim 9.

Regarding claim 40, the APA discloses establishing a minimum number of resource units making up a fixed allocation of resource units; allocating the fixed allocation of resource units to each child user equipment in the partition (APA: Page 1, line 30 through Page 2, line 10). However, the APA as applied above does not specifically disclose that said fixed allocation of resource units being the same for all user equipments of the network. In an analogous art, Sato remedies the deficiencies of the APA by disclosing such limitation wherein the number of allocated channels being the same for all user equipments of the network (see Table 6 on Page 7 and Paragraph 0111 wherein each sector (i.e. A, B and C) has the same number of allocated channels; Page 8, Paragraph 0123, line 1 through Page 9, Paragraph 0139, line 6). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the technique of Sato to the system of the admitted prior art in order to provide an effective method to set an appropriate number resource sin each service area such as sector. However, the APA in view of Sato as applied above does not

specifically disclose allocating remaining resource units which are not allocated in the fixed allocation of resource units to child user equipments, by determining the gain of the radio link between the partition and each child user equipment; and allocating the remaining resource units among the child user equipments by prioritizing user equipments having a high gain link. In an analogous art, Hwang remedies the deficiencies of the APA in view of Sato by disclosing such limitation on Page 4, Paragraph 0068, line 1 through Paragraph 0096, line 6 wherein resources are allocated to the MS having the lowest SIR. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the technique of Hwang to the modified system of the APA in view of Sato in order to provide an effective method of increasing frequency reuse in an OFDM mobile communication system according to a determined number of users.

6. Claims 10, 11, 23 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over the APA in view of Sato as applied to claim 1 above and in view of Hwang and further in view of Jin et al. (US 2004/0147235 A1).

Regarding claim 10, the APA in view of Sato as applied above does not specifically disclose determining the gain of the radio link between the partition and each child user equipment of the partition. In an analogous art, Hwang discloses determining the gain of the radio link between the partition and each child user equipment of the partition (Hwang: Page 4, Paragraph 0068, line 1

through Paragraph 0096, line 6). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the technique of Hwang to the modified system of the APA in view of Sato in order to provide an effective method of increasing frequency reuse in an OFDM mobile communication system according to a determined number of users.

However, the APA in view of Sato and in view of Hwang as applied above does not specifically disclose and regulating the transmit power of each child user equipment according to the determined gain for that user equipment such that lower gain user equipments transmit with high power than higher gain user equipments. In an analogous art, Jin remedies the deficiencies of the APA in view of Sato and in view of Hwang by disclosing such limitation on Page 2, Paragraph 0018, lines 1 – 8 wherein the mobile terminal regulates its transmit power depending on the gain stages. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the technique of Jin to the modified system of the APA in view of Sato and in view of Hwang in order to provide an efficient method and apparatus that compensates for signal dependent gain variations.

Regarding claim 11, the APA in view of Sato and in view of Hwang and further in view of Jin as applied above discloses determining the gain of the radio link between the partition and each child user equipment of the partition (Hwang: Page 4, Paragraph 0068, line 1 through Paragraph 0096, line 6); and regulating the transmit power of each child user equipment such that the transmit power is

inversely proportional to the gain (transmit power dependent on gain variations;
Jin: Page 2, Paragraph 0018, lines 1 – 8).

Regarding claims 23 and 32, the claims are interpreted and rejected for
the same reason as set forth in claim 10.

7. Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wu in
view of Sato and further in view of Hwang.

Regarding claim 36, Wu discloses discarding resource units allocated to
child users equipments in a fixed allocation so as to determine remaining
resource units (*idem*).

However, Wu as applied above does not specifically disclose that said
fixed allocation of resource units being the same for all user equipments of the
network. In an analogous art, Sato remedies the deficiencies of Wu by disclosing
such limitation wherein the number of allocated channels being the same for all
user equipments of the network (see Table 6 on Page 7 and Paragraph 0111
wherein each sector (i.e. A, B and C) has the same number of allocated
channels; Page 8, Paragraph 0123, line 1 through Page 9, Paragraph 0139, line
6). Therefore, it would have been obvious to one of ordinary skill in the art at the
time the invention was made to provide the technique of Sato to the system of
Wu in order to provide an effective method to set an appropriate number
resource sin each service area such as sector.

However, Wu in view of Sato as applied above does not specifically disclose determining the gain of the radio link between the partition and each child user equipment; and allocating the remaining resource units among the child user equipments by prioritizing user equipments having a high gain link.

In an analogous art, Hwang remedies the deficiencies of Wu in view of Sato by disclosing such limitation on Page 4, Paragraph 0068, line 1 through Paragraph 0096, line 6 wherein resources are allocated to the MS having the lowest SIR. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the technique of Hwang to the modified system of Wu in view of Sato in order to provide an effective method of increasing frequency reuse in an OFDM mobile communication system according to a determined number of users.

Allowable Subject Matter

8. Claim 6 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Please refer to the office action mailed on 1/3/2008 for the reason for the statement of reasons for the indication of allowable subject matter.

Response to Arguments

9. Applicant's arguments with respect to claims 1 – 5, 7 – 40 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Un C. Cho whose telephone number is (571)272-7919. The examiner can normally be reached on M ~ F 9:00AM to 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, George Eng can be reached on (571) 272-7495. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2617

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/George Eng/
Supervisory Patent Examiner, Art Unit 2617

/U. C. C./
Examiner, Art Unit 2617